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THE VETERINARY JOURNAL

A Monthly Review of Veterinary Science.

Editor:
FREDERICK HOBDAY, F.R.C.V.S., F.R.S.E.,
HONORARY VETERINARY SURGEON TO HIS MAJESTY THE KING.
MAJOR IN THE ARMY VETERINARY CORPS.
HONORARY MEMBER OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION.
CORRESPONDANT ÉTRANGER DE LA SOCIÉTÉ DE MÉDECINE VÉTÉRINAIRE DU BRABANT (BELGIUM).

Sub-Editor:
GLADSTONE MAYALL, M.R.C.V.S.

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CONTENTS.

EDITORIALS—

The Professional "Entente Cordiale" in France, Italy, and America 115

Our American Colleagues and the Somme Veterinary Medical Society 116

Our Italian Colleagues and "Intesa Amichévole" 117

ORIGINAL COMMUNICATIONS—

Conference of Officers of the French and British Army Veterinary Service, held in France January 12th, 1918— 118

Introductory Address, by Major-General J. Moore, C.B. 119

I—Glanders and Farcy. By Major-General J. Moore, C.B., F.R.C.V.S. 120

II—Notes on Epizootic Lymphangitis. By Major (Temporary Colonel) W. A. Pallin, D.S.O., F.R.C.V.S. .. 122

III—Ulcerative Cellulitis or Ulcerative Lymphangitis. By Colonel A. C. Newsom, C.M.G. 130

Carrel's Tube Treatment for Septic Wounds as adapted to Veterinary Surgery. By Captain E. S. W. Peatt 136

Shoulder Lameness Treated with Injection of Cocaine. By R. Hudson, F.R.C.V.S. 150

REVIEW 152

NOTICES.

All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C.2. Telephone: Gerrard 4646. Telegrams: "Baillière-Rand, London."

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Sub-Editor :

GLADSTONE MAYALL, M.R.C.V.S.

APRIL, 1918.

Editorials.

THE PROFESSIONAL "ENTENTE CORDIALE" IN FRANCE, ITALY AND AMERICA.

In another column we publish a resumé of the proceedings of a conference between British and French veterinary officers at a place "somewhere in France," the cordiality of which demonstrated very conclusively that the *entente cordiale* exists as strongly as ever between our confrères and ourselves, and that the test of true and close relationship during the terrible war has strengthened (if possible) the bond of good fellowship which previously existed. The generous way in which work done by the British was acknowledged by the French, and *vice versa*, proves that in science there is no such thing as jealous rivalry, and that each works equally for the common good. This spirit is the correct one, and the motto of "The greatest good for the greatest number" applies to nothing of greater importance than to the fight against disease. Disease germs acknowledge no nationality, and no clear rules of war, and in the struggle against them it is necessary that no such thing as selfishness exists, but everyone must "do his bit," and, what is equally important, give it to the world.

Conferences such as this one cause interchange of opinion and do inestimable good; for, even if the results attained are not conclusive, they afford mutual encouragement; and, what is more, they give

much food for thought and prevent much loss of time in "sidetracks"; workers being helped along by profiting from the freely acknowledged mistakes of others. Besides which they bring forward new ideas, new devices, new methods of working, and lastly, but by no means least, they make new friendship.

On another page we publish a brief notice of another kind of *entente cordiale* in which our Italian *confrères* also give proofs of the good fellowship which exists between the members of the profession in the two nations. The universal experience of officers of the Army Veterinary Corps during this war has been that nothing could have exceeded the welcome and good fellowship which have been extended to us by our Continental Allies, and now that the Americans are with us they too will share it. The wish expressed by Professor Liautard, in the extracts from a letter published in another column, that American confrères may be admitted to membership of the newly-formed "Somme Veterinary Medical Association" had only to be expressed to be granted. It scarcely needs to be said that they will be welcomed, and, as Professor Liautard puts it, "it will create a pleasant intimacy which will prove of great professional service."

Friendships made in wartime, and under war conditions, are lasting ones, and can be looked upon as being amongst the things which help to counterbalance its terrible horrors and realities. Science never stands still, and the experiences gained now are being utilised as far as is possible during the present, and carefully stored up for future use in the never-ending contest against diseases whose victims are counted in much larger numbers than the actual sufferers from shot or shell. Let us each think of this, and there will be many benefits manifested in the future as the outcome of a series of years when all seemed black and terrible. The true scientist, in our profession as well as of every other, will ever be on the watch for the silver lining of the cloud, and the silver lining is always there, and to be found if looked for earnestly.

OUR AMERICAN COLLEAGUES AND THE SOMME VETERINARY MEDICAL SOCIETY.

Our old and esteemed friend and colleague, Professor Liautard, the *doyen* of the veterinary schools in America, always active in the interests and advancement of veterinary science, having read of the formation of the "Somme Veterinary Medical Association," has written a charming letter of congratulation to his English *confrères*, in which he expresses the hope that now there are many American veterinary

officers in France these might be admitted to membership if ever good luck stationed them in the neighbourhood. He says :—

"I take the opportunity to renew my congratulations for the organisation of the Somme Veterinary Medical Association, the promotion of which I have read in the VETERINARY JOURNAL. I wish it all success possible, and shall be glad to know if American *confrères* who might so desire could hope to be admitted. I am sure that it would create a pleasant intimacy, which would prove of great professional service, and it will give me much pleasure to announce the existence of the new Society in the monthly chronicle which I send to the American Journal."

The letter has been forwarded to the President of the Society (Colonel Newsom, C.M.G.), and Professor Liautard can rest assured that if he or any of his American colleagues are stationed in the neighbourhood of the Somme (or indeed any other) Association Meetings of their British colleagues, a real hearty British welcome will be "right there" awaiting them.

OUR ITALIAN COLLEAGUES AND "INTESA AMICHEVOLE."

ON February 13th, at a garrison town "somewhere in Italy," in which a British Veterinary hospital had become stationed, the military and provincial State veterinary officials (including Professors Torreggiani and Brentana, Capt. Spadoni, Lieut. Vaciago, Signor Sacco, and about twenty others) gave an address and a dinner of welcome to their British colleagues, and a most instructive and pleasant evening was spent. Altogether about thirty members and guests sat down, and the usual loyal toasts to all the Allies were taken in turn, whilst many valuable interchanges of opinion took place. Much useful information was obtained on diseases met with in Italy, diseases from which Great Britain has been for years free, and from which it will be the duty of our profession to safeguard our country after the war. As might have been expected, the *entente cordiale* was well sustained, and nothing could have exceeded the courtesy and kindness of our Italian colleagues. It even compared favourably with the gatherings seen at one of the pre-war meetings of the Central or the Midland Veterinary Medical Societies, and almost carried one back to England again.

Original Communications.

CONFERENCE OF OFFICERS OF THE FRENCH AND BRITISH ARMY VETERINARY SERVICE, HELD IN FRANCE, JANUARY 12TH, 1918.

French Representatives :—

Brigadier-General J. FRAY, Inspector-General, French Army Veterinary Service.
Colonel J. E. R. BERTELOOT.
Major D. BROCQ-ROUSSEAU.
Major E. NICOLAS.
Major V. F. DROUIN.
Lieutenant BOURDON (Interpreter).

British Representatives :—

Major-General J. MOORE, C.B., Director of Veterinary Services, British Expeditionary Force, France.
Colonel A. C. NEWSOM, C.M.G., Deputy-Director of Veterinary Services (Southern).
Colonel E. W. LARNDER, Deputy-Director Veterinary Services (Northern).
Colonel F. W. HUNT, C.M.G., Deputy-Director Veterinary Services, Fourth Army.
Colonel W. J. TATAM, C.M.G., Deputy-Director Veterinary Services, Fifth Army.
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Colonel E. A. KENDALL, C.M.G., Deputy-Director Veterinary Services, Australian Imperial Forces.
Major H. C. JAGGER, representing Deputy-Director of Veterinary Services, Cavalry Corps.
Major E. J. WADLEY, D.S.O., Assistant-Director of Veterinary Services, Headquarters D.V.S.
Major A. LEANING, D.S.O., Officer Commanding, No. 5 Veterinary Hospital.
Major J. MCARTHUR, Officer Commanding, No. 4 Veterinary Hospital.
Captain E. A. WATSON, C.A.V.C., A.V.C. Bacteriological Laboratory, No. 6 Veterinary Hospital.
Captain R. E. J. DAVIS, Officer in Charge, Sales, Paris (Interpreter).

AGENDA.

Introductory Address by Major-General J. MOORE, C.B., D.V.S.

Address on "Glanders," by Major-General J. MOORE, C.B., D.V.S.

Address on "Epizootic Lymphangitis," by Colonel W. A. PALLIN, D.S.O.

Address on "Ulcerative Cellulitis," by Colonel A. C. NEWSOM, C.M.G.

Address on "Periodic Ophthalmia," by Colonel A. C. NEWSOM, C.M.G.

Address on "Control and Treatment of Mange and other Contagious Skin Diseases," by Major E. J. WADLEY, D.S.O.

INTRODUCTORY REMARKS, BY MAJOR-GENERAL J. MOORE, C.B.

MONSIEUR l'Inspecteur-Général Fray and Officers of the Service Vétérinaire Française,—

In February last I suggested to our General Headquarters that the Officers of the French and British Veterinary Services should meet in Conference to discuss matters of professional interest appertaining to animals of our respective Forces. This was agreed to by both French and our own General Headquarters, but, unfortunately, the operations of the summer made postponement necessary.

I had long felt that to come with our Armies to your country and to remain comparative strangers to you, both in reality and in a professional sense, was not as it should be, but that a spirit of friendship and comradeship should exist and be developed between us. It is true that we have met individually on occasions, and have exchanged views to a certain extent on paper, but to my mind a broader *entente* is indicated, and certainly would be more fitting. We, as professional veterinary surgeons, have the opportunity of our lives to study the dire diseases which beset animals on active service. It goes without saying that exchange of opinion with regard to these diseases is beneficial, but occasion may arise when a common front or alliance against them for their proper control and suppression becomes necessary. At least, that we should know what each is doing is advantageous.

It is, therefore, with the greatest pleasure that I welcome you here to-day, and I trust that such gatherings will be continued as opportunity presents itself, and that we may profit by each other's experiences.

Your General Headquarters has expressed a wish that a Report both in French and English should be drawn up after the Conference, and that the conclusions arrived at should be circulated under authority. This I will arrange to have carried out.

I would prefer that Conferences between us should not be made burdensome, but should rather take the form of informal gatherings, because so much more information can be obtained by seeing our work and by ordinary enquiry. There are also so many points to discuss that, for this first Conference, at least, we can only go into generalities.

I have noted down the following diseases for discussion:—

I. Glanders.
II. Epizootic Lymphangitis.
III. Ulcerative Lymphangitis of Nocard; or Ulcerative Cellulitis, as we call it.
IV. Periodic Ophthalmia.
V. Mange.

To form the basis of the discussion of these diseases, I have asked several of my officers to draw up a few short notes in connection with each, and which I now place before you.

I propose that we should devote at most 45 minutes for the discussion of each disease.

I.—GLANDERS AND FARCY.

By Major-General J. Moore, C.B., F.R.C.V.S.,
Director of Veterinary Services.

Glanders—one of our bugbears of previous wars—has not in this campaign been the cause of any real trouble, and, with mallein to aid us in diagnosis, it never will.

For nearly a year after the outbreak of hostilities our Force was singularly free. Then towards the latter part of 1915 the frequent reaction to mallein experienced amongst animals evacuated from units at the Front to Veterinary Hospitals, and further cases discovered in units to which such reactions were referred, challenged our security, and I determined to test the whole of our Force during the comparative inactivity of the ensuing winter. This was carefully carried out by the intra-dermo-palpebral method of mallein testing, kindly introduced to us by the French Veterinary Service and demonstrated by Professor Douville, who was specially sent to us for that purpose. Since that time we have enjoyed comparative immunity.

Each advance into territory taken from the enemy has been productive of a crop of reactors to a limited extent, but under our system of control it is not possible for the disease to gain any ground.

Our procedure of control is as follows:—

(*a*) Routine weekly inspections by Veterinary Officers of units for any evidence of contagious disease, and a certificate as to freedom or otherwise recorded on their weekly returns of sick. Test of any suspicious case.

(*b*) Test of all animals evacuated from the Front on arrival at reception veterinary hospitals.
(*c*) A second test of (*b*) fourteen days later.
(*d*) Test of all units or remounts from overseas on arrivals.
(*e*) Reference to units concerned of any reactor for action within the unit, the result of *post-mortem* examination being clearly stated.
(*f*) Test of all animals on discharge from veterinary hospitals and convalescent horse depots to remount depots.
(*g*) Destruction of reactors; retest of doubtful ones.
(*h*) *Post-mortem* of all reactors for evidence as to clinical or "open" signs of the disease.
(*i*) A double test of units at fourteen days' interval when clinical or "open" symptoms have been discovered.
(*j*) Submission of record of test on the accompanying form to Headquarters D.V.S.
(*k*) Usual measures of isolation, disinfection, and administrative control.

The palpebral method of testing is almost exclusively adopted, the old cervical method being followed as a control test in doubtful reactions in animals affected with ophthalmia.

We are unanimous in declaring the palpebral method superior to the sub-dermal cervical method as an eliminating test in the Field. It is much cheaper, reactors are more readily determined, application is easily and quickly carried out, waste of time in taking temperatures is avoided, and it occasions no interference with the work of units.

The danger of occurrence and spread of glanders in veterinary hospitals is reduced to a minimum by the above-mentioned procedure of mallein test and by the organisation of veterinary hospitals into sub-divisions which are self-contained in their stable arrangements; in fact, so far as watering, feeding, grooming, and the common media of infection in glanders are concerned, each line of stable is practically separate and distinct, so that if anything untoward occurs in one line of stabling, spread of disease is very limited and occasions no trouble.

Discussion.

At the conclusion of his address, General Moore remarked that we were very thankful to the French Veterinary Service for introducing the palpebral method of mallein testing. It has been followed ever since, and is likely to continue. After conducting the test of the whole of the animals of the British Expeditionary Force by this method, a very extensive report was drawn up on the subject and sent to the

British War Office. Following this, the palpebral method was adopted in England, and it is believed to have worked very well there. It is certainly an absolutely indispensable method of dealing with glanders, and it could not possibly be done without.

General Fray, before going on to the different points submitted for discussion, said he wished to make a remark on the origin of the intradermo-palpebral method of mallein testing—a really French method. The originator of the method was Major Drouin. Thanks to him, they had been able to get rid of glanders in the French army. Major Drouin was the first to fix the rules of the method.

Major Drouin then gave some personal details as to the origin of the method. He had been called to Greece on a mission, and there, having to grapple with a widespread outbreak of glanders, and under conditions nearly identical with those of war, he felt the necessity for a practical mallein testing method which excluded the taking of temperatures. He eventually decided on a method which depended solely on local reaction obtained from the intra-dermal injection of mallein into the eyelid. He had first tried other regions suitable for the application of this test, but none appeared to be more so than the eyelid. The results were very gratifying. Together with his collaborator, M. Haudinat, Major Drouin communicated his observations to the Société Centrale de Médécine Vétérinaire on July 17th, 1914, which date in point of time was on the eve of the war.

The "instruction" with regard to dealing with glanders in the French Army was drawn out by Major Drouin. It was based on the new method which has since become universal in that army. Major Drouin noted with pleasure that, as a result of a visit of a French veterinary officer, the British Army had adopted it completely on the lines set out in the "instruction" of December 23rd, 1914.

The technique of the method had been fully defined as early as the month of July, 1914, in the communication made to the Société Centrale de Médécine Vétérinaire.

With regard to the period between the two tests, Major Drouin considered that fourteen days was not sufficient, explaining that whereas in laboratory experiments infection was produced by large doses of virus, in natural infection of the animal the doses of infective matter were often very feeble, with the result that the period of incubation notably exceeds fourteen days, and extends sometimes to one month.

Clinical signs of the disease may, therefore, appear between the first and second test. He believed that many disconcerting results would be avoided if three weeks were allowed to elapse between the two tests.

General Moore pointed out that at first the period had been fixed at three weeks for the second test; but in his opinion—based on considerable experience of glanders—the disease may develop in clinical form before three weeks, and it is dangerous to have it appearing thus. The period of incubation varies, and if three weeks were allowed to elapse between first and second tests, a case of clinical glanders may possibly result, and then troubles begin again. He thought, from a practical working point of view, it was much better to conduct the second test in fourteen days. If an animal had passed two tests, it could be regarded as free from glanders altogether.

Colonel Newsom said that in deciding on fourteen days' interval it was presumed that the animal had become infected before his first test. Thus an animal infected to-day receives the first test in ten days, and does not react. Before the next fourteen days he has probably developed the disease sufficiently to react, though not a clinical case. If a wait of three weeks be allowed, time is afforded for the development of the disease in clinical form.

General Moore said his experience proved that clinical cases of glanders had developed subsequent to the first test, and before the three weeks' interval to the second test had elapsed. It became necessary, therefore, to reduce the period between first and second tests to fourteen days.

Major Drouin believed that it would be wise to fix that period at twenty-one days, or at least twenty days.

With reference to questions (*a*) and (*b*) on General Moore's paper on Glanders, Major Drouin stated that it was well known that no biological test was mathematically accurate, and that a margin of a 5 per cent. of error must be allowed. This degree of error was well outside any ever met with in the practical application of mallein for the detection of glanders.

General Fray remarked that there is no biological agent that may be considered as possessing an absolute value. Mallein is one of the most infallible; but too much should not be expected of it.

In the case of reactions without the subsequent discovery of lesions of glanders on *post-mortem* examination, Major Drouin thought it was probable that this was due to the small and undiscoverable nature of the lesion, or even to a want of thoroughness in detail in conducting the examination. As regards non-reaction to the test in clinical cases, it was generally agreed that the addition of a small quantity of prepared mallein was very unlikely to yield any marked reaction in an animal already overfull of naturally-produced mallein consequent upon the existence of the disease.

General Moore said that it was usual to find when a reaction was

reported from a reception veterinary hospital in a horse evacuated from a unit at the Front, that on referring back to that unit other reactors were discovered, not uncommonly in a horse which had been working next to the affected one in the unit.

General Fray added that in formations at rest the destruction of animals, even after two reactions, may very well be deferred when they do not show clinical signs of glanders. In mobile units, however, after two reactions, whether clinical signs appear or not, there should be no delay in destroying the animal. Besides, the use of mallein does not exclude the necessity for clinical examination, because animals affected with acute and very apparent forms of the disease do not react any more, owing to their being surcharged with naturally produced mallein as a result of the disease.

Colonel Newsom asked what the French view was as to the reliability of the mallein test with regard to mules.

General Fray stated in reply that in both the case of the mule and the ass, in which the disease more generally assumed the acute rather than the chronic form, mallein testing was not so reliable. No modification of the preparation of mallein had so far overcome this difficulty. In testing mules and donkeys it was unwise to rely on the temperatures, but to depend on local reaction entirely.

Major Drouin acknowledged that the mallein test was rather delicate to handle with regard to mules. Mules and asses react very irregularly; the disease often develops in the acute form in these animals, and mallein is mostly reactive to latent glanders.

General Fray, continuing, remarked that in his hands the mallein test had never failed. As a matter of precaution, when a horse with no clinical symptoms reacted to the French test, it was submitted to the old test before being finally destroyed.

Major Drouin added that in the French Army two positive reactions were insisted on before destruction was carried out, except when units were on the move or when local conditions made it necessary to destroy after one positive reaction only.

General Moore said that in view of the fact that we were at war it was unwise to take risks, and therefore it was better to destroy positive reactors at once.

II.—NOTES ON EPIZOOTIC LYMPHANGITIS.

By Major (Temporary Colonel) W. A. PALLIN, D.S.O., F.R.C.V.S., A.V.C., D.D.V.S., *Third Army, B.E.F.*

Mr. Chairman and Gentlemen,—

I take it as a very great honour that I should have been asked to open the discussion on epizootic lymphangitis; but it has been

my lot to come in contact with this disease so often, and in so many different countries, that I have had, I may say, rather exceptional opportunities of studying it, and observing the development and course of the disease in almost every possible phase.

We are, I think, all well acquainted with the causal agent and characteristics of the disease, the classical symptoms of which are: Pustules, granulating sores or buds on the course of the lymphatic vessels, accompanied by corded lymphatics in the vicinity of the lesions, the commonest seats of the same being those regions which are most prone to wounds, such as the cannon bones, knees, the inside of the fore-arm, the hocks, and the inside of the thigh, where the lesions, when present, are, as a rule, exhibited in their most typical form. But in dealing with outbreaks of epizootic lymphangitis it would appear to me that the secret of success is the faculty for suspecting its presence, and diagnosing it at once in all its forms—or, to be more accurate, in all its sites and under all conditions—no matter what other diseases of a similar nature may be prevalent at the same time. I wish to lay particular stress on this point, as some of the lesions which I have, from time to time, seen presented, such as those developing in the submaxillary space after strangles, in the scrotum after castration, on the conjuctiva, on the lips, and also on the nasal mucous membrane, all of which are, to say the least, most confusing, more especially to those who have not had previous experience of this disease. One should have a picture of the characteristic appearance of the epizootic lymphangitis bud, or sore, in one's eye always, so that one may constantly be on one's guard, and at the same time be able to warn others what to look for. And, then, one should be also well acquainted with the microscopical diagnosis, which, of course, is the only certain method of demonstrating the presence or otherwise of the disease; and in this respect we are, needless to say, greatly indebted, not only to Rivolta, the well-known Italian savant, for being the first to discover the cryptococcus, but also to our renowned confrères, the late Professor Nocard and Professor Leclainche, the eminent French veterinarians, for giving us the first clear description of a disease which, for years previously, had almost invariably been confounded with glanders (farcy), ulcerative lymphangitis, and a host of other ulcerating and suppurating diseases.

In dealing with an outbreak of epizootic lymphangitis, undoubtedly the cardinal points are:—

(1) Power of early and accurate clinical diagnosis, and of being able to confirm same by the microscope.

(2) Completeness of the arrangements for isolation, and also for keeping track of the "wound incontacts."

(3) Stringent manner in which the prophylactic measures are carried out.

In examining specimens of pus under the microscope, although a diagnosis may be made with a one-sixth, it is considered that for accurate work a one-twelfth oil immersion is indispensable; also, the necessity for partially shutting off the light is a most important factor in revealing the presence of the organism together with its characteristic refractile double outline.

As we are all well aware, the death-rate from this disease is low; but in view of the long and indefinite period of incubation, the protracted course which cases of this disease take before a cure can be effected, their highly infectious nature, and the fact that some cases which are apparently cured are apt to recur, the first point to be decided is, whether it is advisable from an economical point of view to undertake treatment, or whether wholesale destruction of every case verified should be adopted. If an outbreak can be nipped in the bud—which, with vigorous action, I am confident it can be—then I strongly recommend destruction of every verified case.

When the disease was introduced into England in 1902, and also in Ireland during the following year, I advocated the destruction of every verified case. The Civil and Military authorities in both countries pinned their faith to the procedure recommended, and the disease was completely stamped out in the course of something less than two years, and would no doubt have been eradicated much sooner had it not been allowed to spread to such an extent before it was recognised; but in this matter we were greatly handicapped by having so few veterinary surgeons in Great Britain or Ireland who had ever seen the disease before, or who could make an accurate diagnosis.

During the present campaign, so far as the British Expeditionary Force in France is concerned, our animals have kept marvellously free from the disease; and it was not until September 7th, 1917, that the first case made its appearance. The source of infection in this instance is not known, but the case appears to have been recognised and disposed of at once, as no other cases have developed up to date amongst the incontacts in this particular incident. At other centres, however, we have, perhaps, not been quite so fortunate, and in one cavalry regiment alone thirty-nine cases have occurred as a result of the disease not being detected in time. Still, the total number of cases (viz., seventy-eight) which we have had in the British Expeditionary Force up to date is wonderfully small, and speaks very well for the vigilance of our service, and for the prophylactic measures which we have in vogue, included in which is the policy of immediate destruction of all verified cases, as already indicated.

When treatment is resorted to, such as the complete extirpation of the tissues invaded, it should follow the usual lines for treatment of surgical cases ; and, of the many antiseptics tried, it has been found that perchloride of mercury in solution of not less than 1 in 500 has proved the most effective for the treatment of this disease.

Cartier, in *Le Recueil de Médécine Vétérinaire*, recommends the use of potassium iodide in epizootic lymphangitis. He prefers, instead of injecting solutions of the salt into the veins, to give it by the mouth in rather large doses (from 12 to 20 grammes). Usually the treatment is divided into periods of from twelve to fifteen days, with six or seven days' interval between them. The abscesses and nodules are opened and scraped and the wounds washed with solutions of iodine and potassium iodide in order to destroy the parasites *in situ;* and to impede their dissemination, the ulcers are covered with a powder containing one part of mercuric iodide to sixty of talc.—(*La Clinica Veterinaria.*)

I am of opinion that a unit cannot be considered free until six months after the occurrence of the last case. Cured cases should be branded " E. L." and kept in working isolation for not less than twelve months, if possible. . " Wound incontacts " should also be kept in working isolation for not less than six months, if possible.

Finally, the free use of the microscope cannot be too forcibly impressed upon those who have to deal with an outbreak of this disease. Much time and unnecessary isolation of animals is saved by an early diagnosis, such as can only be made by the microscope. Material from suspicious wounds should be periodically examined; and even in cases when nothing has been detected at first, further examination may prove the presence of the organisms.

I attach herewith a copy of the form which is used in the British Expeditionary Force in connection with outbreaks of this disease, from which it will be seen that one of the points upon which particular stress is laid is the branding and isolating of the " wound incontacts," as, needless to say, owing to the very indefinite period of incubation, and the insidious manner in which the disease spreads, the rounding-up and earmarking of all animals which have been exposed to wound infection, as well as ordinary contact, are, I consider, the greatest difficulties one has to contend with.

In conclusion, I put forward five points for discussion, viz. :—

(1) What are the minimum and maximum incubative periods of this disease ?

(2) In the interests of the State, is it a more economical procedure to destroy all verified cases of the disease than to resort to treatment ?

(3) If treatment is resorted to, what is the best and most effective method ?

(4) What are the chances of cured cases recurring ?

(5) How long will the organism retain its vitality outside the body ?

EPIZOOTIC LYMPHANGITIS.

(To be rendered by the D.A.D.V.S. Division, A.D.V.S. Cavalry Division, O.C. Veterinary Hospital, or C.H.D. or S.V.O. Remount Depot, through usual channels to H.Q., Veterinary Directorate.)

1. Unit.
2. Description of Animal.
3. History :—
   - (*a*) Date of discovery.
   - (*b*) Probable date clinically affected.
   - (*c*) Nature of lesion and seat.
   - (*d*) If confirmed by microscope.
   - (*e*) Date destroyed.
   - (*f*) Date joined Unit and where from.
   - (*g*) Where located during past three months, and period of time in each case.
   - (*h*) If suffered from a wound or Ulcerative Cellulitis during that time and date.
   - (*i*) Opinion as to most likely source of infection.
4. Number of wound incontacts since date shown at (*b*) and disposal of each.
5. Description and position of stables or standings where case occurred.
6. Action taken in respect to outbreak.
7. Remarks by A.D.V.S. Corps.
8. Remarks by D.D.V.S. Army, Cavalry Corps, or Area.

INSTRUCTIONS REGARDING AN OUTBREAK OF EPIZOOTIC LYMPHANGITIS : FOR GENERAL GUIDANCE.

1. Isolate case immediately.
2. Report to Administrative Veterinary Officer by wire or telephone.
3. Confirm diagnosis by microscope.
4. Destroy animal and bury carcase deeply, unskinned.
5. Enquire into history of animal, and its movements for past three months.
6. Take evidence with regard to any previous wound or Ulcerative Cellulitis.
7. Vacate standings and thoroughly disinfect ground.
8. Disinfect harness and equipment of Unit.
9. Burn clothing, grooming kit and line gear of affected animal and animals on either side, also stable litter.
10. Burn all soiled dressings used in treatment of wounds.
11. Stop all hand dressing of wounds.
12. Restrict use of cotton wool and tow.
13. Ensure dressing of wounds under strict veterinary supervision.
14. Exercise care with regard to veterinary instruments, particularly knives, probes, forceps, scissors. Boil after use.
15. Reduce number of kicks, galls, and other surface injuries so far as possible.
16. Examine carefully all animals of Unit for wounds.
17. Stencil letters " E.C. " (meaning Epizootic Lymphangitis—incontact) on off thigh of all animals of the Unit found with wounds, however slight, at the time of inspection, or from probable date clinically affected.
18. All wounds, however slight, to be reported and a record kept.
19. Unit in which case occurred to be placed in working isolation with special attention to wound incontacts.
20. All " E.C." animals to be treated in isolation when admitted to veterinary hospital.
21. Carefully study pamphlet on Epizootic Lymphangitis by Colonel W. A. Pallin, D.S.O., A.V.C., issued to all V.O.'s of B.E.F.

DISCUSSION.

General Fray said that the British Army had been much more fortunate than the French, who had encountered many cases. In every 100 horses suffering from lymphangitis, an average of ten were affected with epizootic lymphangitis, fifteen with ulcerative lymphangitis (ulcerative cellulitis), while in the remainder were found the most varied bacteriological species, so that they had a number of forms of lymphangitis. No specific treatment suitable for all these forms had been discovered. He believed, however, that wholesale destruction should not be practised.

The occurrence of cases of epizootic lymphangitis remains very much the same from one end of the year to the other. Mud seemed to be a medium for transmission of the disease, but flies did not appear to play an active part in spreading infection. Only animals with a commercial value were treated. Those which were not susceptible of cure within three months were sent to the butcher's, the meat only being used after excision of the affected parts.

The French opinion, voiced by Major Drouin, as to the period of incubation was that it was never less than three months in the naturally acquired disease.

General Moore expressed the opinion that it varied from three weeks to three months.

Colonel Hunt considered two and a half months was most probable.

Colonel Pallin quoted the fact that Professor Mettam (Dublin) had experimentally produced a nodule of the disease in forty days, which had developed into a pustule in forty-five days.

General Moore explained that it was necessary, not only to prevent serious invasion amongst the animals of the Force, but to guard against its admission into England at the conclusion of the war, and for this reason the policy of immediate destruction was adopted in the British Expeditionary Force.

Major Nicolas stated that at the Front in the French Army at least half the cases which came to light were cured in from one month to six weeks. In cases where cure was not apparent or infection was serious the animals were destroyed.

The treatment adopted was that of excision of the lesions and corded lymphatics, followed by cauterisation. Pyo-vaccination was practised in conjunction with this.

With regard to question 4 in the paper, General Fray said he had met with cases of recurrence of the disease in cured animals in Algeria.

Major Nicolas, on the other hand, stated that such recurrence had not been met with in his experience in France.

General Fray added that the French had methods which were very good; one of these—viz., auto-pyotherapy, favoured by Major Drouin, and adopted in Morocco, yielded good results in epizootic lymphangitis.

Large doses of mallein have been recommended as regards ulcerative cellulitis.

They could, and must, treat epizootic lymphangitis in the French Army. He believed it to be curable, and said that it was much less dangerous than ulcerative lymphangitis (ulcerative cellulitis), which they had not been able to subdue yet.

III.—ULCERATIVE CELLULITIS OR ULCERATIVE LYMPHANGITIS.

By COLONEL A. C. NEWSOM, C.M.G., D.D.V.S. (Southern).

This disease being non-existent in England, Canada, and America, was, prior to the war, little known to English veterinary surgeons.

History.—Towards the end of July, 1916, it first began to make its presence felt in the English Army in France, and since then it has been making steady progress, till at the present time the numbers under treatment are considerable, and the average weekly admissions from the Field show a tendency to increase.

From the time its presence was recognised it was realised as likely to prove a menace to efficiency. Early evacuation of infected cases and their concentration in special centres for treatment was ordered. A special officer (Captain E. A. Watson, of the Canadian Army Veterinary Corps) was told off to work on the bacteriological side of the disease with a view to preparation of some means of vaccine-therapy, as it was realised that it was only on these lines success in combating the trouble was likely to be met.

The following vaccines have been produced and given trial:—

(1) From pure culture of Preiz-Nocard bacillus, prepared by the alcohol-ether method.

(2) A polyvalent mixed vaccine containing Preiz-Nocard bacilli and such other organisms as are generally met with, consequent upon accidental infection, in ordinary lesions of the disease.

(3) A pyo-vaccine made by treating the pus from a case of generalised infection (generally from a kidney abscess).

(4) A hyper-immunised serum, from an animal which has been subjected to the ordinary process of hyper-immunisation.

Results of Treatment.—Speaking generally, it may be said that it is only in the cases of early injection that satisfactory results in treat-

ment of any kind can be anticipated. Where evidence of long-standing or severe infection exists, the most economic procedure is to destroy, and this is the policy which has been adopted. All animals showing multiple lesions of more than average severity, or in which more than one limb is involved, or which exhibit lesions above the knee or hock, as the case may be, or which, from their general condition, suggest the existence of internal (kidney) abscess formation, and finally all known cases of relapse, are destroyed.

Treatment by the various vaccines as above summarised have given sufficiently satisfactory results to justify the hope that real good may follow a continuance of effort.

Pyo-vaccination, as far as can be judged, shows the best results, and all who are employing this means speak well of it.

The laboratory work which has been carried out with hyper-immunised serum gives promise of possible advantage to come from its employment, in so far that it has been found to exercise a distinct antibactericidal influence. A trace of the serum in an otherwise suitable medium entirely prevents growth.

Experiments are being tried with this agent alone as a hypodermic or intra-venous injection, and also as a local dressing for wounds, and others in combination with ordinary and pyo-vaccines; but in relation to these it is too early to give any opinion as to their practical value.

General Treatment.—It has been found that cure of lesions may be brought about by the use of ordinary antiseptic dressings; and such special agents as picric acid, methylene blue, scarlet red, as well as the intra-muscular injection of iodine and various mercurial preparations, have resulted in what would, at first sight, appear to be cure, but, in the main, cases so treated have exhibited a tendency to recur.

Source of Infection and Method of Spread.—The number of cases which become infected after admission to hospital is, comparatively speaking, small. The majority of the cases come from the Field, and there can be little doubt that the chief causes are infected mud and contaminated billets.

Infection from animal to animal is not as important a factor as in the other forms of specific lymphangitis.

While present conditions obtain, it is not very evident that preventive action is possible, other than the very important one of ensuring the thorough disinfection of railway trucks.

In the present knowledge of the disease, it is not clear that one attack affords immunity, and if this be so, there is no prospect of a preventive vaccination being found.

DISCUSSION.

Colonel Newsom went on to say that during the winter of 1915–16 a very large number of cases affected with skin lesions of one kind or another were met with. Amongst these were the so-called "frost-bites" (a condition really due to the action of the bacillus necrosis) and other affections of the skin of the lower part of the limbs. As the year advanced it became apparent that there were amongst these a number affected with a specific disease characterised by general cellulitis of the limb or limbs affected, and associated with the development of ulcers which did not appear to be directly connected with one another. To those the name "ulcerative cellulitis" was given; and though later in the year 1916 it was discovered that these were due to the presence of the bacillus of Preisz-Nocard, this name was adhered to in order to avoid confusion.

Treatment.—Every known form of treatment was applied, and it was found quite easy to cure any given lesions; but these invariably tended to recur, and it was only by the use of vaccines that any real cure could be said to result.

It was noticed that, where the sea was available, a combination of sea baths with the employment of vaccines gave very satisfactory results.

General Moore stated that there had been a very large number of cases of cellulitis, and those which were not considered worthy of treatment were sent to the butcher.

Captain Watson had at the present time 1,400 cases under his care. A summary of a report on these by the officer working under Captain Watson's direction was read by Captain Davis.

NOTES ON TREATMENT OF ULCERATIVE CELLULITIS AT DETACHMENTS OF NO. 24 VETERINARY HOSPITAL, FROM NOVEMBER 19TH, 1917, TO JANUARY 11TH, 1918.

Summary of Total Cases admitted to Hospital.

Cured.	Sent to Butcher.	Died.	Cast.	Remaining.	Total.
595	229	2 (one of these arrived dead in train.)	2	572	1,400

Cured animals are sent to No. 24 Veterinary Hospital, Gournay-en-Bray. A certain percentage have in addition to ulcerative cellulitis other diseases, such as mange, ophthalmia, etc. These secondary diseases are treated at this hospital, but when the cellulitis is cured they are then transferred to No. 24 Veterinary Hospital, irrespective of the condition of the other diseases with which they are affected.

Altogether 634 animals have been discharged from this hospital

to No. 24 as cured; but thirty-nine cases have been returned here, having had a recurrence of the cellulitis.

Animals previous to December 20th, 1917, had been treated with Preisz-Nocard vaccine, or treatment other than by injections. The summary of cases treated up to that date is as follows:—

Up to and including December 20th, 1917.

Cured.	Sent to Butcher	Died.	Cast.	Remaining.	Total.
383	24	*Nil.*	2	703	1,112

On December 18th, 1917, Captain Watson, C.A.V.C., paid a visit to this hospital, bringing with him, in addition to Preisz-Nocard vaccine, a supply of prepared pus and serum. He requested that these should be tested against each other. Sixty animals were, therefore, selected and divided into three twenties, each twenty containing a similar number of mild, medium, and advanced cases. In the case of the animals treated with serum it was intended, after seven days' injection, to sub-divide this group of twenty into two of ten, continuing the daily injection of serum with the one group, and in the case of the other proceeding to vaccine treatment with Preisz-Nocard vaccine. It was, however, found that at the end of seven days the supply of serum was exhausted, so the whole twenty were, therefore, treated with Preisz-Nocard vaccines.

Group No. 1. Serum.		Group No. 2. Pus.		Group No. 3, P.-N. Vaccine.	
Cured	9	Cured	12	Cured	8
Doing well; no discharge from ulcers, but requiring a few days for superficial wounds to heal	5	Doing well, but requiring a few days for wounds to heal	2	Doing well but requiring further time	9
Requiring further treatment	3	Requiring further treatment	2	Doubtful case—possibly a butcher	1
Doubtful cases—possibly butchers	3	Butcher cases	4	Butchers	2

Group No. 1.—Treatment consisted of injecting 15 c.c. of serum daily for seven days, and then proceeding with Preisz-Nocard vaccine, commencing with 2 c.c. and increasing the dose by 1 c.c. each week. Local treatment consisted of well washing with saline solution. Exercise was given whenever possible; but the roads having been so slippery lately, exercise had, unfortunately, to be abandoned on several days. Remarks as to local treatment and exercise apply to all three groups.

Group No. 2.—In this case treatment commenced with 2 c.c. of prepared pus injected hypodermically in the neck—near side one week, off-side the next. Each week an injection was given, increasing the dose by 1 c.c. each time.

Group No. 3.—In this case treatment was commenced by giving 1 c.c. or 2 c.c. Preisz-Nocard vaccine hypodermically, and increasing the dose by ½ c.c. or 1 c.c. as thought necessary. One injection was given each week. Polyvalent vaccine was given when thought necessary in doses of 2 or more c.c.

It is certainly not fair to deduce final conclusions at the present stage of these tests, but the following may be submitted as tentative conclusions based on the progress made up to the present :—

(*a*) No form of treatment in advanced cases seems to be of any avail.

(*b*) From the above it follows that cases of ulcerative cellulitis should be submitted to treatment by anti-bodies in the initial stages of the disease.

(*c*) From the results of the comparative treatments, up to the present, that of prepared pus vaccine seems to be the most effective, as progress is more rapid and less thickening is left.

(*d*) The results of the other two groups were about equal, and no very definite conclusion as to their relative merits can be submitted as a result of this experiment. Certain it is, however, that in this particular instance progress was more slow than in the case of the group treated by prepared pus.

Summary of Cases sent to Butcher.

Number of cases sent without any treatment at all a few days after being admitted to hospital	105
Number of cases sent after treatment by other means than vaccine	16
Number of cases sent after treatment by Preisz-Nocard vaccine	87
Number of cases sent after treatment by prepared pus ..	21
	229

Many of the cases sent to the butcher after treatment by vaccine were sent a few days after arrival at this hospital, having been treated by the vaccine before arriving here.

It is, therefore, submitted that a more uniform standard of condemnation should be aimed at.

(Signed) H. J. HINES, Captain A.V.C.

General Fray stated that ulcerative lymphangitis (cellulitis) cases were treated with attenuated pure cultures of Preisz-Nocard bacilli. The percentage of cures of horses affected with this disease was 15 per cent. This was confirmed by the bacteriological observations, by which means, also, the percentage of cases of ulcerative cellulitis was approximately fixed.

Before closing the discussion on this subject it was agreed between General Fray and General Moore that the officers working in the laboratories of the French and British Veterinary Services should keep in constant touch, and acquaint each other with the results of their researches into animal diseases.

Captain Watson stated that it was possible to immunise animals against the Preisz-Nocard bacillus to such an extent as to enable them to resist enormous doses of living cultures.

Major Drouin agreed with this, but pointed out that in his experience this was only possible when dealing with the pure Preisz-Nocard bacillus culture, and that this constituted the difficulty in coping with the disease, as the majority of the cases met with were complicated by the presence of other organisms.

Captain Watson replied that this was his experience also, and that he had found, where simple Preisz-Nocard infection existed, cure in a very short time had been comparatively easy, and that in such cured cases observation extending over six months or longer failed to show any signs of recurrence of the disease.

General Moore stated that the policy of early evacuation was adopted with the object of enabling treatment to be undertaken before serious contamination had been brought about, or before invasion had become so well established as to seriously lessen the chance of recovery.

General Fray said that in the French Army it was considered that the disease was imported from America, as, though it had been met with in France before the war, it had never been encountered in anything like the numbers which have developed since the war broke out

General Moore pointed out that the existence of the disease was denied both in America and England; and went on to say that, having in view the enormous amount of contamination of the soil which had taken place as the result of the concentration of so many animals in such a comparatively small area, it was not to be wondered at that specific diseases should be extensively met with throughout the Force. He stated, in explanation of this, that 5,000,000 tons of dung and 3,000,000 gallons of urine had been excreted by the animals of the British Force alone since the beginning of the war.

(*To be continued in next issue.*)

CARREL'S TUBE TREATMENT FOR SEPTIC WOUNDS AS ADAPTED TO VETERINARY SURGERY.

By Captain E. S. W. PEATT,
Army Veterinary Corps.

The treatment consists of a constant or intermittent instillation into wounds of a chosen antiseptic solution, conveyed to all parts of the wound by means of rubber tubes. Few, if any, of the wounds seen in horses, excepting some operation wounds, are sterile; but in spite of this all simple wounds heal rapidly with ordinary treatment. The cases noted here, however, have all been bad cases in which there was a doubt of recovery—e.g., fistulous withers, quittors, incomplete splintered fractures with sinuses discharging quantities of pus, old sinuses and abscesses, open joints, and tendon sheaths. This treatment which I have adapted is a modification of "Carrel's tube treatment," now in universal use for septic wounds in the human subject.

Apparatus Required.

(1) A reservoir in the form of a small tank with a pipe leading from the bottom; the tanks are used in different sizes according to type of wound; the capacity varies from 4 to 10 pints—one to hold 6 pints is a useful size; the reservoir is fixed above the animal to the roof or wall at a slightly higher altitude than the wound.

A syringe is employed where a reservoir cannot be used.

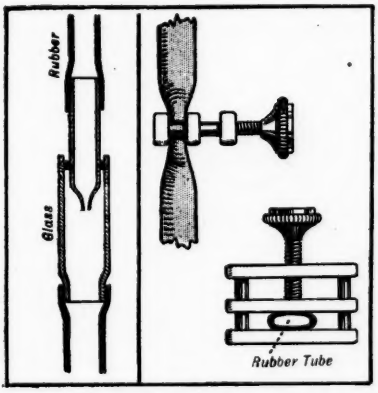
(2) Rubber tubing of two kinds—(*a*) conducting tubes, and (*b*) instillation tubes.

(*a*) The conducting tube has the larger lumen, about $\frac{1}{4}$ in.; it leads from the pipe on the bottom of the reservoir to the wound, therefore varies a lot in length—4 to 6 ft. is the usual length. This tube has a stop-cock on it which regulates the flow of fluid. At the wound it is divided into the required number of instillation tubes, one to eight, by means of a glass distributing tube; or if only one tube is needed, and the wound is large, the conducting tube may go direct to wound.

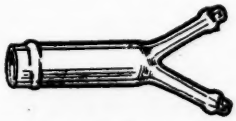
(*b*) These instillation tubes go direct to the various parts of the wound where they are needed. They are small tubes from 9 ins. to 2 ft. long, with a lumen varying from 1-16th to $\frac{1}{4}$ inch, and may, or may not, be perforated laterally with small openings; if these openings are present, the end of the tube is generally ligatured. If a reservoir cannot be used, then the fluid is instilled into the wound every two hours by a syringe, whose nozzle is placed direct into the instillation tubes, no conducting tube being necessary.

Conducting or "instillation" tubes, rubber, with multiple holes, closed at one end.

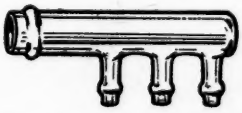
(A) Tube 30 cm. long, pierced over a length of 5 cm.
(B) Tube 30 cm. long, pierced over a length of 10 cm.
(C) Tube 40 cm. long, pierced for a length of 15 cm.
(D) Tube 40 cm. long, pierced for a length of 20 cm.
(10 *cm.* = *about* 4 *inches*).



"Drop-counter," Gentile's. Screw pinch-cock (*Pince de Mohr à vis*).



Glass distributing tube with two branches (*verre de Gentile*).



Glass distributing tube with three branches (*verre de Gentile*).

Apparatus for intermittent instillation: *a*, Reservoir (*ampoule or flask holding a litre*); *b*, Irrigating tube with a diameter of 7 mm.; *c*, Pinch-cock (*Pince de Mohr*); *d*, Distributing tube with 4 branches; *e*, Conducting tubes.

The illustrations above are taken from Carrel and Dehelly's Treatment of Infected Wounds.—(*Bailliere, Tindall & Cox.*)

In this method, after injecting the fluid, the free end of the instillation tube must be closed by placing a piece of gauze over the lumen and putting a clip on it—e.g., a bull-dog artery forceps—to keep out dust and dirt, etc. If a reservoir is being used, the animal must be tied up short and have a heel shackle on so that he cannot lie down or move about enough to disturb the tubes in the wound. If rugs are being used, the tube can be prevented from pulling out of the wound by tying it to the rug with tapes. In leg cases the conducting tube is kept in position by pieces of bandage, tying it to leg at intervals. A pair of long-handled bullet forceps are often useful to conduct tubes to the bottom of a deep wound.

Antiseptic Fluids Used.

Two were tried: (1) Eusol solution; (2) Dakin's solution.

(1) To prepare Eusol use the following preparations:—

℞ 25 drachms of B.P. Liquor Cal. Chlorinat, dilute with 1 pint water.

Boric acid, 1¾ drachms.

Add the lime to the water first, shake and put in the boric acid, shake again and allow to stand overnight. Filter off, and the clear fluid is ready for use. This solution is made fresh every night, is kept in the dark, and allowed to stand twelve hours before use.

(2) To prepare 10 litres of Dakin's solution:—

℞ Chloride of lime (having 25 per cent. active chlorine)	184	grammes.
Carbonate of soda, anhydrous ..	92	,,
or		
Carbonate of soda, crystals	262	,,
Bicarbonate of soda	76	,,

Place the chloride of lime and 5 litres of water in a 12-litre flask, shake, and leave all night. Dissolve the carbonate and bicarbonate of soda in 5 litres of cold water. Mix the soda solution and the chloride of lime solution, shake, and allow to settle for half an hour. Then syphon off the clear liquid and filter till clear, and keep away from light and in a cool place.

Preparation of Wound.

This treatment must not be used on operation wounds until hemorrhage has ceased, because the blood clogs up the tubes, and also it is impossible to plug the wound tight enough to stop bleeding if tubes are in it. To allow penetration of the antiseptic fluid, all dead tissue and foreign bodies are removed, and anything that is likely to

harbour organisms and so tend to keep the wound septic. In human surgery a dependent opening for drainage is said to be unnecessary if Carrel's treatment is employed, but most of the cases noted here had good drainage ; two cases at present, however, are being treated without a dependent orifice and are doing well.

METHOD OF DRESSING.

It is essential that the fluid come in contact with the tissues in all parts of the wound, especially the deeper sinuses and loculi,

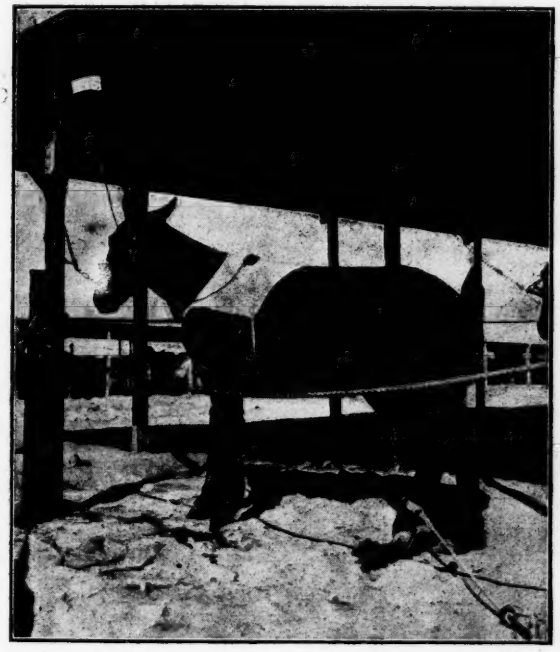


FIG. 1.

therefore wounds must be carefully examined by probing and manipulation, etc., till a thorough knowledge of all the peculiarities of the wound is obtained—e.g. its tracts, diseased portions, and deeper loculi. One must make use of this knowledge when dressing the wound, and pass tubes to the parts which are known to be the seat of infection.

How to Dress Three Common Varieties of Wounds.

(1) Punctured or cup-shaped wound with no dependent opening. Introduce a plain tube to the bottom of the wound, which is then kept filled up with the fluid. The tube is securely fixed in wound :—

(*a*) If the mouth of the wound is small, by wrapping a strip of gauze round the tube and plugging it into wound like a cork into a bottle.

(*b*) If it is a large wound and (*a*) is impossible, a stitch in the skin tied round the tube will hold it in. This method was used in a large number of cases.

(*c*) If the wound is on a limb, the tube can be bandaged in.

(*d*) If the wound is on the body where a bandage cannot be used, but where a piece of linen or calico can be fixed on by means of tapes—e.g. over the withers—by fixing four tapes one to each corner, tying the front two in front of the neck and

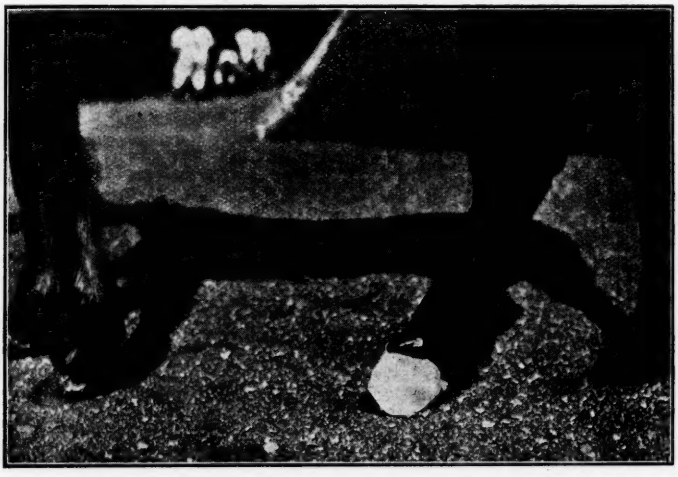


FIG. 2.

the other two below the chest. (See photograph.) On head, by making a bandage head collar and fixing numnah on it. (See photograph.) Then the tube can be fixed by stitching small, square pieces of numnah on the linen or calico at the point where the tube is to enter; a small hole is made through both numnah and calico, being a tight fit for the tube; the numnah then grips the tube, when it is pulled through this hole and holds it firmly.

(*e*) If the wound is a superior one and the tube will stay in it easily, then only a square piece of cotton wool with a hole for tube to protrude through is needed. The wool is stuck

on over wound by means of gum smeared on the skin an inch from the edge of the wound all round it. In winding tortuous wounds, pieces of gauze must be used in the wound to pack the tubes in position. An objection to sticking a piece of wool over a wound with gum is that the continuous trickle of fluid soaks the wool and it drops off; therefore it is a good idea not to stick the wool to the skin immediately below the most dependent part of the wound, so that fluid does not tend to wash it off.

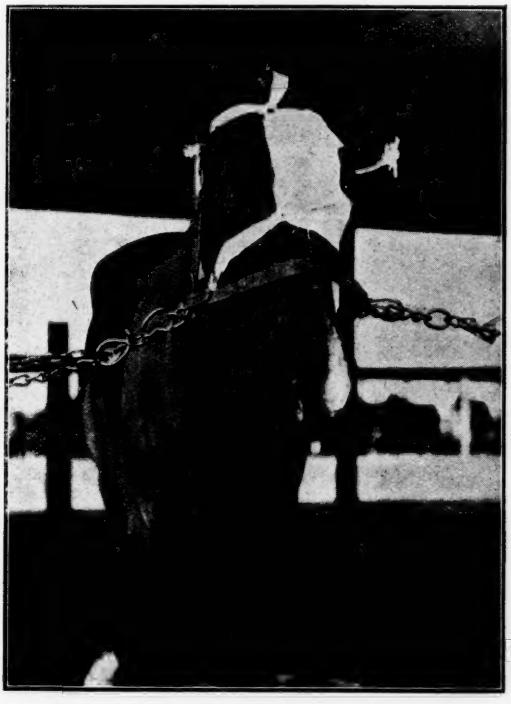


FIG. 3.

(2) In a surface wound an instillation tube with lateral openings and its end ligatured is laid on the surface to be treated, and kept in position by one of the methods mentioned above.

(3) Fistulæ or Seton type of wound having two openings.—Place a laterally perforated tube in at upper opening and plug the dependent one so that the fluid soaks gradually through, otherwise it escapes too

quickly, especially if the wound is vertical. In the latter variety of wound—i.e. vertical, only place a short length of tube into the wound so that the fluid flows over the whole surface of the wound before escaping. Use as few gauze and cotton-wool pledgets as possible in a wound to keep tubes in position, as they soak up pus and harbour organisms. The skin round the wound is cleansed by treating it with oil and petrol dressing.

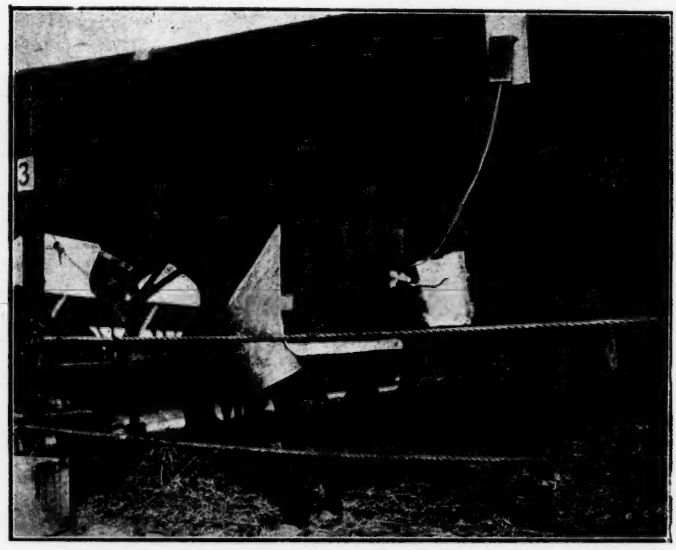


FIG. 4.—Large Sinus Flank. (Not in Summary of Results.)

APPLICATION OF ANTISEPTIC.

The instillation tubes being placed in position in the wound and the dressing being completed, the instillation tubes are connected up to the reservoir by means of the conducting tube, and glass distributing tube if necessary. When a glass distributing tube is used it must be fastened to the dressing by a safety-pin or tape.

The stop-cock is turned on sufficiently every two hours to allow the fluid to trickle slowly into the wound, the quantity varying with the wound from 5 ozs. to 2 pints. This is the procedure day and night, the wound being dressed every twenty-four hours by being flushed out with Eusol, the skin round it being cleansed with oil and petrol dressing and sterile tubes put in. The used tubes are thoroughly

FIG. 6.

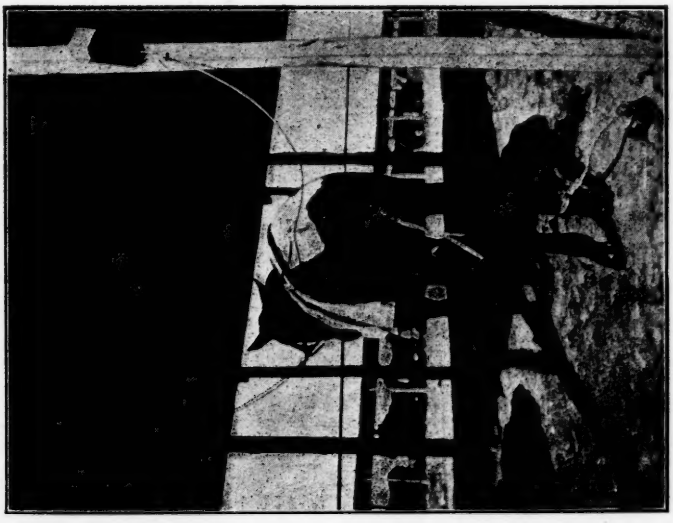


FIG. 5.

washed out and placed for twelve hours in 5 per cent. carbolic acid lotion before being used again.

In human surgery a daily microscopic examination is made of each wound by taking smears, and when organisms disappear and the wound becomes sterile it is sutured, and heals as if by first intention. This is not practicable in veterinary surgery, as the wound is never kept absolutely sterile, and by experience we have found that most wounds in horses and mules heal as quickly without suturing, with less likelihood of complications, and leave if anything a smaller cicatrix.

Most of the cases noted here were treated with Eusol, the remainder with Dakin's solution; no appreciable difference in the results given by the two liquids was noted.

SOME POINTS IN FAVOUR OF THIS TREATMENT.

(1) Wounds can be treated practically continuously with an antiseptic without the work entailed by removal of the dressing.

(2) The antiseptic penetrates to the most remote parts of the wound to those areas where it is most needed.

(3) The continuous application of the treatment both by its antiseptic and mechanical actions must be an improvement on the older method, where, even if the antiseptic was as good, it was probably only used once every twenty-four hours, and then did not penetrate to the deepest part of the wound.

(4) The tissues are conserved owing to such large operation wounds being unnecessary and granulations are not so profuse.

(5) The fluid has the valuable property of assisting a rapid dissolution of necrosed tissue.

(6) Pain after operation seems to subside more quickly than when other treatments are used, and in the case of an animal with a temperature, and other symptoms of toxæmia or general infection, the temperature drops and the other symptoms disappear after the treatment has progressed for a short time—e.g. 24 to 36 hours.

(7) The fluid used is economical.

(8) The results are excellent.

RESULTS OF CASES TREATED.

No. of Case.	Animal.	Condition.	Operation.	Treatment.	Results.
2	Bay Mare .. L.D.	Quittor near Hind.	Operated 14–11–17 by window method, rasping down horn of quarter and making two openings, one above and one below coronary band, leaving the band intact. Removed all remaining cartilage, portions of it green. This animal had been operated on before several times.	Packed with dry dressing and gauze. Next day put in two tubes above band, keeping them in by wrapping sufficient gauze round them to plug the opening; also plugged wound below band to prevent the too rapid escape of the fluid. The tubes were then bandaged securely to pastern (see photo). Eusol solution was syringed into tubes every two hours. The sensitive laminæ laid bare by removal of horn were smeared with Archangel tar and a very tight bandage applied to keep down granulations; the latter were removed by knife about once a fortnight. All the quittor cases were treated by this method. (See photo. No. II).	Wound completely healed 20–12–17. Discharged into Kraals 10–1–18.
3	Dark Bay Mare L.D.	Quittor N.H. ..	Operated 15–11–17 ..	Similar to No. 2; was a bad case; wound is healed but horn not grown over yet.	Still under treatment.
7	Chestnut Geld. H.D.	,, O.H. ..	Operated 26–11–17 ..	As usual, had been operated on and treated before.	Healed and discharged into Kraals 27–12–17.
8	Chestnut Mare	,, N.H. ..	Operated 26–11–17 ..	Do. Do. ..	Discharged into Kraals 20–12–17.
9	Brown Mule Gelding.	,, O.H.	Operated 29–11–17 ..	Do. Do. ..	Completely healed. Discharged into Kraals 7–1–18.
15	Bay Mare H.D.	,, O.H. ..	Operated 18–12–17 ..	Do. Do. ..	Wound healed, tube removed 30–1–18.

RESULTS OF CASES TREATED.—*Continued.*

No. of Case.	Animal.	Condition.	Operation.	Treatment.	Results.
24	Bay Mare L.D.	Quittor N.H. ..	Operated 10–12–17 ..	As usual, had been operated on and treated before.	Was destroyed for old age and quittor.
32	Dark Grey Mule.	. N.H. ..	Operated 12–12–17 and removed a lot of necrosed cartilage.	Do. Do. ..	Completely healed. 12–1–18.
4	Dark Brown Geld. Mule.	Fistulous withers and vertebræ diseased.	Made two vertical incisions on each side, removed tops of diseased vertebræ and all necrotic tissue, curetted stumps of vertebræ. Operated twice, on 12–11–17 and 16–1–18, removed tops of vertebræ.	Plugged with dry dressing after opening. Put in tubes next day supplied from reservoir. To keep tubes firmly held in wound pieces of numnah were sewn on a square piece of calico over place where tubes were to enter; holes were then made through both numnah and calico a fairly tight fit for tubes. The calico, was strapped on wither by tapes under forearms. (See photo No. I).	Healed and discharged into Kraals 1–2–18.
14	Black Mare Mule.	Fistulous withers.	Operated 19–12–17, only making a small wound; removed pieces of diseased spine, curetted same, and removed some necrotic tissue.	Treated similar to No. 4. This animal was operated on before several times and treated in different ways.	This case has done very well up to date. Wound healed, discharge ceased, but skin not grown over.
29	Bay Gelding	Fistulous wither..	Operated 10–1–18 curetted; vertebral spines and removed necrotic tissue.	Similar to No. 4	Still under treatment and doing well.
6	Brown Mare Mule.	Incomplete splintered fracture of external angle of ilium.	Operated 24–11–17; removed broken pieces of bone, curetted main bone.	Put in one tube, securing it with a stitch through skin at upper edge of wound and dressed by sticking a square piece of wool over wound with gum.	Healed and discharged into Kraals 15–12–17.
16	Brown Mule	Sinus buttock ..	——	——	Died suddenly.

17	Brown Mare Mule.	Splintered fracture of tuberischium.	Operated twice, 21–12–17 and 8–1–18; removed broken pieces of bone, and curetted.	Was a bad case, large quantities of laudable pus oozing from wound. Put in two tubes and used irrigator.	Healed excepting wound in skin, 30–1–18.
18	Chestnut Gelding, Mule	Similar to No. 17, but worse.	Operated 21–12–17; made dependent opening.	This was a worse case than No. 17, and was not expected to recover; it ceased discharging in 4-6 days, and healed in a remarkable manner.	Healed excepting skin wound, 27–1–18.
23	Br. Gelding, Mule.	Splintered fracture of radius.	Operated 24–12–17; opened up sinus, removed bone, and curetted.	Kept tube in with bandage	Healed and discharged into Kraals 8–1–18.
26	Dun Gelding, Mule.	Fractures of spines of sacrum.	Operated 8–1–18; removed tops of spines, curetted and removed some necrotic tissue.	Laid tube with side openings along wound and covered with cotton wool stuck with gum. (See photo No. 5).	Discharge ceased in 5 days; granulations have grown over spines; only skin wound left.
27	Dark Brown Gelding, Mule.	Similar to 26; not so bad.	Operated 8-1-18	Similar to No. 27	Healed 28–1–18.
1	Dark Brown Gelding.	Picked up nail, piercing lateral lacuna of frog, and going forward and up to coronet, which was under-run.	Operated 3–11–17; got drainage from coronet along course of nail by cutting out sinus made by nail. Made a superior opening above coronary band where abscess under band had pointed.	The day after operation one tube was fixed in wound above band by means of a gauze plug; only a short piece of tube protruding into wound so that fluid came into contact with whole wound. The wound in frog was plugged with gauze and kept in position with tow and plates. Tube was bandaged in and fluid injected by syringe every two hours. Horse was very lame, could bear no weight on foot.	Discharge ceased in 3 days; wound healed very rapidly, and on 21–11–17 wound was completely healed and horse trotting sound. This was a marvellously rapid recovery.
10	Brown Mule, Gelding.	Old suppurating sinus on outside of hock.	Operated 2–12–17; opened up; there was a lot of pus.	Bandaged in tube and treated as usual. (See photo No. 6.)	Wound completely healed and mule discharged into Kraals 10–12–17.

RESULTS OF CASES TREATED.—*Continued.*

No. of Case.	Animal.	Condition.	Operation.	Treatment.	Results.
12	Bay Mare, Rider.	Punctured wound outside hock, lot of discharge.	Did not operate	Put in a single tube to bottom of sinus. 12–12–17.	Wound healed and mule discharged into Kraals, 24–12–17.
19	Bay Gelding	Old septic abscess in muscles of second thigh.	Operated 22–12–17; opened up.	Put in one tube	Wound healed 8–1–18 and discharged to Kraals.
20	Brown Mare, Mule.	Punctured wound elbow joint; the latter under-run with pus.	Operated 22–12–17 ..	Put in one tube	Wound healed 9–1–18, and discharged into Kraals.
21	Br. Gelding, Mule.	Sinus of dorsal veterbræ similar to fistulous wither.	Operated 24–12–17; removed necrotic tissue and curetted. Been operated on before several times; a very old case.	Laid tube with lateral openings along wound and placed a piece of cotton wool on top.	Healed and in Kraals 9–1–18. Very good case.
22	Brown Mule	Sinus buttock ..	Operated 24–12–17 ..	Put in two tubes	Still under treatment.
30	Br. Gelding, Mule.	Bad septic sinus hock and also side of tendons.	Did not operate	Put in one tube 15–1–18	Healed and discharged into Kraals 30–1–18.
25	Br. Gelding, Mule.	Splintered fracture of ext. angle of ilium.	Operated 1–1–18; removed pieces of bone and curetted.	Put in one tube	Healed and discharged into Kraals 15–1–18.
5	Bay Gelding, L.D.	Punct. wound kick; oil being discharged.	Did not operate	Put one tube in wound 24–11–17 ..	Healed and discharged into Kraals 18–12–17.
11	Br. Gelding, Rider.	Open hock joint, result of kick; oil flowing out and one of the small bones fractured.	Removed piece of bone two days after treatment had begun.	Put in tube 12–12–17, or rather laid a perforated tube over wound, bandaging it on with gauze and bandage. Used irrigator and kept a constant flow of fluid over wound till oil ceased.	Oil ceased discharging on 20–12–17. Horse going sound and discharged into Kraals on 1–1–18.

13	Black Gelding	Over-reached jumping, severing both back tendons and laying sheath open with a gaping wound filled with mud, etc.	Cleansed wound thoroughly, clipping off pieces of necrosed tendon and flushing out with Eusol.	Put in one tube first, 7–11–17, right down between sheath and tendons. Small abscesses then appeared at pastern, were opened and had tubes put in, probably a lymphatic infection. Granulations appeared rapidly on edges of wound and were removed by scalpel and treated with a mixture of Cupri. Sulph. and Zinc Sulph. and as tight a bandage as possible. Calkins were tried on shoe of affected leg, but caused horse to knuckle and were removed.	Wound completely healed and horse walking on leg, 8–12–17, at present date he walks much better; tendons are working and there is practically no thickening.
28	Bay Mare, Rider.	Transverse wound of back tendons, only severing sheath and part of flexor perforatus; oil being discharged.	Trimmed edges of wound, which were granulating on admittance.	Put in tube 9–1–18, and used a bandage and granulation dressing on wound's edges.	Discharge ceased; tendon sheath healed 30–1–18. Wound still in skin.
31	Grey Gelding	Ulcerative lymphangitis, a discharging wound being present on outside of fetlock; horse going very lame and having a temp. of 103° F.	Did not operate	Put one tube into wound, and after wound got too small laid it on over wound, 28–1–18.	Temp. normal; horse standing on leg in three days. Wound ceased discharging and almost healed.

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SHOULDER LAMENESS TREATED WITH INJECTION OF COCAINE.

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HAVING arrived at a satisfactory diagnosis that the cause of the lameness is situated in the shoulder, which frequently presents considerable difficulty, injection of cocaine may give remarkable results, as shown in the following cases :—

What the actual cause of the lameness may be I cannot say. I have not known the precise history of the cases, which might give a clue to whatever tissue changes may have taken place. Local manipulation affords little help beyond atrophy of the muscle, often very slight, and possibly resulting from other causes. P.M.E. is rarely obtainable, and I doubt if it would lead to any definite conclusions. From the results obtained one might imagine that these cases may be of rheumatic origin. I am inclined to think that they originated in a sprain of the lower portion of the supra spinatus muscle and tissues in the immediate neighbourhood, which later takes on a rheumatic condition.

Case 1.—A good sort of a sixteen-stone hunter. The history revealed that he had been lame many months, during which time he had been point fired along the metacarpal bone, and frequently blistered. My client saw him and borrowed him (being badly in want of a ride and low in finances), the owner being thankful to be rid of him. The new owner had him only a week when he was so lame as to be unridable.

I found him pointing well out, which the groom assured me he had done since he arrived. The foot, however, was cool, of good shape and appeared above suspicion. The shoulder muscles around the outside and front of the joint felt less than those of the opposite side, and the bony prominences sharp, but this might result from resting the limb.

Between the shoulder and the foot nothing could be detected. Movement at rest and in action showed nothing definite to me. We see so often "pointing" in connection with foot lameness that it is difficult to associate it with other lameness, but that it frequently takes place in shoulder lameness I am sure, though there is a difference in the way they point.

Liautard says: "The foot rests upon the entire plantar surface, instead of the toe alone, with the heels raised as in navicular arthritis," and if bedding is removed and the horse carefully watched this will often be found true.

Slight changes in the contour of the shoulder may easily be overlooked and passed over during manipulation. Having stood

the patient on the level ground with all legs square, the head should be raised, and, standing directly in front of him, both shoulders should be carefully compared and any sharpness sought for. Then, still standing in front, the head being raised and held in a centre line, both hands should follow the line of the scapular spine, the scapular muscles and the region of the shoulder joint. A softness of the muscles (sup. and infra spinatus) at their lower extremity may be detected, giving also a sharper feel to the bony prominences.

Examination is often surer in the stable, because the horse is less restive. Swaying of the body when the attention is taken up with outside objects may interfere with a sure examination.

I had not given much thought to the difference there might be in the way a horse points, and so feel pretty certain.

Case I was a foot case, but I intended to make myself more certain by injecting cocaine over the plantar nerves and attempted the injection next day.

On trying to inject there was such a scene that I found it impossible. —the patient knowing about interference from previous experience. However, I got it into the shoulder in the fossa at the lower extremity of the supra spinatus muscle.

Having waited about ten minutes I had him trotted out and he went almost soundly. I then had him ridden on ploughed land and he went sound.

The horse did some two months' hunting, carrying a heavy hard rider, kept sound, and was sold at the end of the season for a good figure.

Case II.—A five-year-old fourteen-stone hunter gelding. The owner rode him in to fetch me to a colic case, and as he went away, after standing a short time, he showed great lameness, presenting quite a three-cornered aspect from behind. Enquiry revealed that he was a gift horse from a hunting gentleman who had passed him on as being incurable. I persuaded the owner to let me inject him, and did so a few days later.

Marked improvement was shown about ten minutes after injection. The horse was given three days' rest before trial by the owner, who, to use his own words, jumped him over every fence on the farm and could not lame him.

I had him out on several occasions and found him sound. After some weeks he was being ridden shepherding by the owner's wife when he suddenly pitched forward on to his nose, and remained down a considerable time in a state of semi-coma. Luckily the lady fell clear, but got such a shock that the owner sent him to the kennels, considering him unsafe to ride.

A good many cases have passed through my hands and shown excellent results. Two to four c.c. of ten per cent. solution has been injected, the point of injection gently rubbed, and about ten minutes allowed before trotting out.

From one to three weeks' complete rest in a box with good feeding is an advantage. The solution is injected 1½ inches deep.

Review.

PRACTICAL VETERINARY PHARMACOLOGY AND THERAPEUTICS.—By Howard J. Milks, D.V.M., Professor of Therapeutics and Small Animal Clinic. New York State Veterinary College, at Cornell University, Ithaca, N.Y. Pages, 518; well illustrated. Published by The Macmillan Co., New York and London. Price 22s. net.

This is an excellent book; it is well indexed, and the busy practitioner can soon look up the uses and effects of any drug he wishes to prescribe in animal ailments. Where prescription writing is carried out the would-be user of Latin terms will not make any errors if he follows the instructions herein. All the drugs in general use in the United States Pharmacopœia are referred to fully and many of the preparations only used occasionally are intelligently discussed.

This is the first book in which we have seen an account of the composition and method of using *arecovetrol*. The author deserves great commendation for the note on it. Our own druggists now ought to get busy in putting it on the market for veterinarians, especially if cattle practice is to advance. Under the text on common salt, we are rather surprised that its uses for gastro-intestinal lavage and method of employment in the dog has not been described or mentioned. Medicinal paraffin in canine practice is valuable. The author's note on it as an internal or external remedy is too short.

Chapter XXX, dealing with Bacterins, Serums, Vaccines, and Antitoxins, is useful, concise, and up to date.

Throughout the work the author's plan has been to enable veterinary surgeons to use drugs in a reasoned and intelligent manner, and many typical prescriptions illustrate the ways medicines may be dispensed. The binding and get-up of the book are excellent. It is a good standard volume to lie handy for daily reference and consultation. We think the author may be congratulated on having produced a comprehensive book which will add considerably to the technical knowledge regarding the uses and dispensing of drugs in daily practice. G.M.

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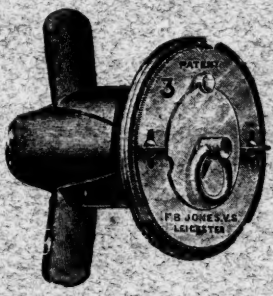

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